

We Claim:

1. A resin comprising the reaction product of
  - a. the reaction product of phenol and formaldehyde introduced in a molar ratio of formaldehyde to phenol of between about 1.20 and about 2.0 reacted at a temperature of between about 70 and about 90°C in the presence of between about 0.01 and about 0.1 moles of alkaline catalyst per mole of phenol to form a resin precursor having a free formaldehyde concentration of less than about 0.5 weight% and
  - b. a formaldehyde scavenger in quantity sufficient and at a temperature of between about 70 and about 90°C for a time sufficient to produce a resin having a free formaldehyde concentration of less than about 0.15 weight% in the resin.
2. The resin of claim 1 wherein the molar ratio of scavenger to phenol is between about 0.02 and about 0.25.
3. The resin of claim 2 wherein the molar ratio of scavenger to phenol is between about 0.05 and about 0.16.
4. The resin of claim 1 further having a free phenol concentration of between about 2 and about 12 weight%.
5. The resin of claim 1 wherein the catalyst is present in an amount between about 0.03 and about 0.09 moles per mole of phenol.
6. The resin of claim 1 wherein the catalyst is present in an amount between about 0.04 and about 0.07 moles per mole of phenol.
7. An A-stage phenol formaldehyde resole resin having a free formaldehyde concentration less than about 0.15 weight%, said resin comprising the reaction product of
  - a. the reaction product of phenol and formaldehyde in a molar ratio of formaldehyde to phenol of between about 1.20 and about 2.0 at a temperature of between about 70 and about 90°C in the presence of between about 0.01 and about 0.1 moles of

alkaline catalyst per mole of phenol to form a resin precursor having a free formaldehyde concentration of less than about 0.5 weight% and

b. a formaldehyde scavenger.

8. The resin of claim 7 wherein the molar ratio of scavenger to phenol is between about 0.02 and about 0.25.

9. The resin of claim 8 wherein the molar ratio of scavenger to phenol is between about 0.05 and about 0.16.

10. The resin of claim 7 further having a free phenol concentration of between about 2 and about 12 weight%.

11. The resin of claim 7 wherein the catalyst is present in an amount between about 0.03 and about 0.09 moles per mole of phenol.

12. The resin of claim 7 wherein the catalyst is present in an amount between about 0.04 and about 0.07 moles per mole of phenol.

13. A method for producing A-stage phenol formaldehyde resole resin comprising

a. reacting phenol and formaldehyde introduced into a reactor in a molar ratio of formaldehyde to phenol of between about 1.2 and about 2.0 at a temperature between about 70 and about 90°C in the presence of between about 0.01 and about 0.1 moles of alkaline catalyst per mole of phenol for a time sufficient to produce a resin precursor and

b. reacting the resin precursor at a temperature above 70°C with a formaldehyde scavenger in a quantity and for a time sufficient to yield a resin having a free formaldehyde concentration of less than about 0.15 weight%.

14. The method of claim 13 wherein the molar ratio of scavenger to phenol is between about 0.02 and about 0.25.

15. The method of claim 14 wherein the molar ratio of scavenger to phenol is between about 0.05 and about 0.16.

16. The method of claim 13 further having a free phenol concentration of between about 2 and about 12 weight%.

17. The method of claim 13 wherein the catalyst is present in an amount between about 0.03 and about 0.09 moles per mole of phenol.

18. The method of claim 13 wherein the catalyst is present in an amount between about 0.04 and about 0.07 moles per mole of phenol.